6. (Amended) A method for determining the thickness of a ferromagnetic material having a known conductivity and permeability comprising the steps of:

(a) engaging the ferromagnetic material with a constant signal electrically isolated from ~~with~~ the ferromagnetic material for inducing an changed signal,

(b) generating an electrically isolated -swept saturation signal over a range of current for engagement with the ferromagnetic material,

(c) detecting by electrically isolated means the change signal as the saturation signal is swept over the range of currents,

(d) determining the relationship between the changed signal and the swept saturation signal, and

(e) evaluating the thickness of the material based upon the relationship between the changed signal and the swept saturation signal.

REMARKS

THE REJECTION OF CLAIMS UNDER 35 U.S.C. §102(a)

The Examiner has rejected claims 1-9 under 35 U.S.C. 102(a) as being anticipated by *Martin et al.,* U.S. Patent no. 5,283,529 (hereinafter "Martin et al."). Section 2131 of the MPEP states that a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art source. See also Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Further it must be the identical invention. See Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989)

The Examiner states that the claimed invention reads on Martin et al. as follows:

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"The method claims 1-4 and 6-9, recited for using the apparatus in claim 5 is used for the apparatus of Martin et al. and are rejected on the same grounds. It would find that the apparatus of Martin et al. operates in the functional manner claimed by applicant.

With reference to claim 5, Martin et al. disclose an apparatus for determining thickness of an apparatus for determining the thickness of a ferromagnetic Material 34 of Figs. 1-11 having known conductivity and permeability comprising a transmitter 30 of Figs. 1-10 for engaging a constant signal E of Figs. 2-10 with the ferromagnetic material for creating a changed signal of Figs. 2-11;

A saturation device 406 of Fig. 10 for generating a saturation signal of Fig. 2-10 over a range of currents I of Fig. 6 for engagement with the ferromagnetic material;

> "A receiver 30c of Fig. 10 for detecting the changed signal as the saturation signal is varied over the range of currents as shown in Figs. 5-11, such that the relationship between the changed signal and the saturation signal is determined, and the thickness as shown in Figs. 7-8 of the material based upon the relationship is determined as shown in Figs. 2-11 (Column 13-14, line 1-68)."

The Applicant has amended the specification and claims as indicated above. It is the Applicant's position that amendments to the specification merely restates, and thereby clarifies, the information disclosed in the original text of the specification. The gap or space between the apparatus of the invention and the ferromagnetic material, clearly shown in FIG. 9 and discussed at page 13, at lines 17 – 19, distinguish the Applicants' invention from the teaching of Martin et al. This gap is necessitates the electrical isolation of saturation, transmitter and receiver components from the material to be measured. This is contrasted to the unequivocal text of Martin et al. stating at column 8, line 36-44 as follows:

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> "This whole structure including segments *161a-o*, springs *50a-o* and 52*a-o* are assembled in such a way as the allow the segments 161 to conform as exactly as possible to the inside diameter of the pipe. *The segment 161 needs the most intimate contact possible to obtain maximum magnetic metal to metal contact with the pipe in order to eliminate "air gaps" and still maintain mechanical integrity.* " (Emphasis added.)

Martin et al also states that "to keep down *wear and tear* it is desirable to program a short degaussing release signal between each energizing pulse to all more time for the tool to move in the well." The Martin patent elsewhere makes clear that the apparatus is used when firmly anchored to the material to be measured.

Accordingly, it is the position of the Applicant that Martin et al. does not meet the standard or requirements for a Section 102 rejection under Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (1989). Recall that Richardson is referenced in MPEP Section 2131 and states "the identical invention must be shown in as complete detail as in the ... claim." The Applicant submits that Martin et al. does not disclose the identical invention as claimed by the Applicant.

Further, it the Applicant respectfully submits the reference to Martin is inappropriate in view of, inter alia, Figure 4, showing the direct contact between the electrically conductive elements of the apparatus and the well casing, Figure 5, showing the electrical circuit formed between the apparatus and the electrically conductive well casing, and the text "the segment **161** needs *the most intimate contact possible* to obtain maximum magnetic metal to metal contact with the pipe in order to *eliminate air gaps*... ." (Reference Col. 8, line 39-42. Emphasis added.)

The excerpt of the second claim of the Martin patent also states "apply an anchoring voltage to each of said coils so as to electromagnetically anchor said array to said pipe at a specified depth and said voltage being sufficient for the

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current in said coils to reach a value at which localized areas of the pipe are substantially magnetically saturated, which makes zones of said pipe adjacent each of said magnetically coupled coils substantially transparent to AC electromagnetic signals."

The Applicant's invention does not utilize an electrical contact between the electrically conductive ferromagnetic material and the apparatus of the invention. Reference is made, inter alia, to page 13, line 20 of the Applicant's specification and to Figure 9. Accordingly, the Applicant respectfully suggests that the Martin patent so significantly differs from the Applicant's invention that isolated elements can not extracted and combined together for the rejection of Applicant's claims.

COMMENTS ON REMAINING REFERENCES CITED BY THE EXAMINER

The Applicant has reviewed the additional references made of record and does not believe any one of these references taken alone or in combination would inhibit the patentability of the invention of the present application.

SUMMARY

The Applicant has corrected the informalities of the Title and Specification noted by the Examiner. The Applicant has also amended claims 1, 5, and 6, thereby obviating the basis of the Examiner's rejection under 35 U.S.C. Section 102. The Applicant has also properly traversed the rejections of claims by the Examiner and accordingly, the Applicant believes the application is in order for allowance. Such action is respectfully requested this 2nd day of April 2003.

Respectfully Submitted,

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REVISED PARAGRAPHS OF SPECIFICATION
(WITHOUT MARKUP SHOWING CHANGE)

At Page 13, beginning at line 20.

"FIG. 9 illustrates on embodiment of the apparatus of the present invention particularly showing the relationship among the component for generating a magnetic flux for saturation, the transmitter generating an oscillating flux, the receiver coil for receiving the changed signal and the material to be measured."

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[Beginning at the final paragraph on Page 13 and continuing to Page 14.]

"FIG. 9 illustrates one embodiment of a magnetic transparency generator or apparatus **500** of the present invention. The apparatus **500** is used to generate the transparency current required in practicing the present invention. The magnetic transparency generator/apparatus **500** provide for containing flux lines to completely saturate the intended material **100** volume region. Also, FIG 9 illustrates one embodiment of the flux circuit core **501** for use with the present invention. The flux circuit core **501** comprises a top flange **504**, a bottom flange **505** and a core **552**. The core **552**, upon which the coils of the electromagnet are wrapped, is located between the top flange **504** and bottom flange **505**. The material **100** is also illustrated. The complete magnetic transparency generator **500** incorporates the flux circuit core **501** for providing a transparent volume region that is illustrated having a width W **920**, a height H **930** and a thickness L **960**. The space or gap between the magnetic transparency generator **500** and the material **100** is illustrated by G **950**. The barrier volume region may be termed the target material. It is appreciated that the transmitter coils **300**, the receiver coils **580** and the transparency coil **551** are in positions of geometric nulling with respect to the magnetic transparency generator of apparatus **500** illustrated of the present invention."

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REVISED CLAIMS (WITHOUT MARKUPS SHOWING CHANGES)

1. (Amended) A method for determining the thickness of a ferromagnetic material having a known conductivity and permeability comprising the steps of:

(a) engaging the ferromagnetic material with an electrically isolated constant signal that is an electromagnetic signal of constant frequency and amplitude for inducing a changed signal within the ferromagnetic material,

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(b) generating a stepped saturation signal over a range of currents that is electrically isolated from the ferromagnetic material for engagements with the ferromagnetic material,

(c) detecting by electrically isolated means the changed signal as the saturation signal is varied over the range of currents,

(d) determining the relationship between the changed signal and the stepped saturation signal, and

(e) evaluating the thickness of the material based upon the relationship between the charged signal and the stepped saturation signal.

5. (Amended) An apparatus for determining the thickness of a ferromagnetic material having known conductivity and permeability while said apparatus is electrically isolated from the material comprising:

(a) a transmitter electrically isolated from the ferromagnetic material for engaging the ferromagnetic material with a constant signal that is an electromagnetic signal having constant frequency and amplitude for inducing a changed signal within the ferromagnetic material,

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(b) a saturation device electrically isolated from the ferromagnetic material for generating a saturation signal over a range of currents for engagement with the ferromagnetic material,

(c) a receiver electrically isolated from the ferromagnetic material for detecting the changed signal as the saturation signal is varied over the range of currents, such that the relationship between the changed

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signal and the saturation signal is determined, and the thickness of the material based upon the relationship is determined.

6. (Amended) A method for determining the thickness of a ferromagnetic material having a known conductivity and permeability comprising the steps of:

(a) engaging the ferromagnetic material with a constant signal electrically isolated from the ferromagnetic material for inducing an changed signal,

(b) generating an electrically isolated swept saturation signal over a range of current for engagement with the ferromagnetic material,

(c) detecting by electrically isolated means the change signal as the saturation signal is swept over the range of currents,

(d) determining the relationship between the changed signal and the swept saturation signal, and

(e) evaluating the thickness of the material based upon the relationship between the changed signal and the swept saturation signal.

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REVISED CLAIMS (MARKED TO SHOW CHANGES)

1. (Amended) A method for determining the thickness of a ferromagnetic material having a known conductivity and permeability comprising the steps of:

(a) engaging the ferromagnetic material with an electrically isolated constant signal that is an electromagnetic signal of constant frequency and amplitude ~~with the ferromagnetic material~~ for inducing a changed signal within the ferromagnetic material,

(b) generating a stepped saturation signal over a range of currents that is electrically isolated from the ferromagnetic material for engagements with the ferromagnetic material,

(c) detecting by electrically isolated means the changed signal as the saturation signal is varied over the range of currents,

(d) determining the relationship between the changed signal and the stepped saturation signal, and

(e) evaluating the thickness of the material based upon the relationship between the charged signal and the stepped saturation signal.

5. (Amended) An apparatus for determining the thickness of a ferromagnetic material having known conductivity and permeability ~~comprising~~ while said apparatus is electrically isolated from the material comprising:

(a) a transmitter electrically isolated from the ferromagnetic material for engaging the ferromagnetic material with a constant signal that is an electromagnetic signal having constant frequency and amplitude ~~with the ferromagnetic material~~ for ~~creating~~ inducing a changed signal within the ferromagnetic material,

(b) a saturation device electrically isolated from the ferromagnetic material for generating a saturation signal over a range of currents for engagement with the ferromagnetic material,

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(c) a receiver electrically isolated from the ferromagnetic material for detecting the changed signal as the saturation signal is varied over the range of currents, such that the relationship between the changed signal and the saturation signal is determined, and the thickness of the material based upon the relationship is determined.

6. (Amended) A method for determining the thickness of a ferromagnetic material having a known conductivity and permeability comprising the steps of:

(a) engaging the ferromagnetic material with a constant signal electrically isolated from ~~with~~ the ferromagnetic material for inducing an changed signal,

(b) generating an electrically isolated -swept saturation signal over a range of current for engagement with the ferromagnetic material,

(c) detecting by electrically isolated means the change signal as the saturation signal is swept over the range of currents,

(d) determining the relationship between the changed signal and the swept saturation signal, and

(e) evaluating the thickness of the material based upon the relationship between the changed signal and the swept saturation signal.

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